6. Other RD Elements

Section 6 contains the documents that satisfy the non-design output (i.e., "other") Remedial Design required elements including, but not limited to, the project design criteria, major equipment identification, and health and safety plan.

6.1 Glovebox Excavator Method T&FRs

Technical and Functional Requirements for the OU 7-10 Glovebox Excavator Method Project

September 2002

Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC

TFR-2527
Revision 3

Technical and Functional Requirements for the OU 7-10 Glovebox Excavator Method Project

September 2002

Idaho National Engineering and Environmental Laboratory
Environmental Restoration Program
Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
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Technical and Functional Requirements for the OU 7-10 Glovebox Excavator Method Project

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Revision 3

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ABSTRACT

This document constitutes the technical and functional requirements for the design and implementation of the Operable Unit (OU) 7-10 Glovebox Excavator Method Project facility for the OU 7-10 waste retrieval demonstration. Under the *Federal Facility Agreement and Consent Order*, the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory was designated as Waste Area Group 7 and was subdivided into 13 operable units including OU 7-10, which comprises Pit 9. The OU 7-10 Glovebox Excavator Method Project is the selected alternative for demonstrating a successful retrieval of waste from OU 7-10.

The *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho* specifies environmental remediation of transuranic waste from OU 7-10. On October 1, 2001, the Idaho National Engineering and Environmental Laboratory published the *Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications* that identifies a path forward for a waste retrieval demonstration that demonstrates a feasible approach for retrieving waste from OU 7-10. The OU 7-10 Glovebox Excavator Method Project was established to accomplish the objectives presented in that report. The overall objectives for the project are as follows:

- Demonstrate waste zone material retrieval
- Provide information on any contaminants of concern present in the underburden
- Characterize waste zone material for safe and compliant storage
- Package and store waste zone material onsite, pending a decision on final disposition.

The requirements presented in this technical and functional requirements document establish the technical baseline for the project and link the requirements presented in the *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho;* the *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering Laboratory*; the *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory;* and Appendix A of the *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: Operable Unit OU 7-10 (Pit 9 Project Interim Action).* Design, procurement, construction, testing, operation, safe shutdown, layup, and deactivation, decontamination, and decommissioning will be based on the requirements listed in this document.

CONTENTS

ACRONYMS

ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
D&D&D	deactivation, decontamination, and decommissioning
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EPA	U.S. Environmental Protection Agency
FHA	fire hazard analysis
FY	fiscal year
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
LMAES	Lockheed Martin Advanced Environmental Systems
NCP	National Contingency Plan
OSHA	Occupational Safety and Health Administration
OU	operable unit
PC	performance category
PCB	polychlorinated biphenyl
PGS	Packaging Glovebox System
RCRA	Resource Conservation and Recovery Act
RCS	Retrieval Confinement Structure
ROD	record of decision
RRWAC	Reusable Property, Recyclable Materials, and Waste Acceptance Criteria
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
SSC	structures, systems, and components

TBD	to be determined
T&FR	technical and functional requirement
TRU	transuranic
TSCA	Toxic Substances Control Act
WAC	waste acceptance criteria
WAG	waste area group
WBS	Work Breakdown Structure
WES	Weather Enclosure Structure
WIPP	Waste Isolation Pilot Plant

DEFINITIONS

Component. Item of equipment such as a pump, valve, or relay, or an element of a larger array such as computer software, length of pipe, elbow, or reducer.

Deactivation, decontamination, and decommissioning (D&D&D). Generally refers to the set of activities or phase of the project dealing with the final disposition of the facility; for example, permanently disabling or deenergizing equipment, final decontamination (if necessary), and dismantlement for reuse or disposal.

Functional requirement. A requirement that specifies what the design solution must do.

Hazard category. A classification of the consequence of unmitigated releases from facilities or operations.

Hazardous waste. Resource Conservation and Recovery Act - Any hazardous waste as defined in 40 CFR 261.3, "Definition of Hazardous Waste."

Layup. A period, rather than a process, during which the facility is monitored and maintained in stable and known conditions. Note: This term is comparable to the term surveillance and maintenance in the standard D&D&D vernacular.

Performance category. A classification using a graded approach in which structures, systems, or components in a category are designed for similar levels of protection (i.e., they meet the same performance goal and damage consequences) during natural phenomena hazard events.

Performance requirement. A requirement that states how well functions must be performed and allows for verification.

Shutdown (also safe shutdown). (1) The set of activities (i.e., process) performed to identify and mitigate facility hazards to place said facility in stable and known conditions that are cost-effective to maintain and (2) the state of the facility after shutdown activities were successfully performed. Note: This term is related to the term deactivation in the standard D&D&D vernacular, which implies permanent disabling of equipment. However, as used in this plan, shutdown relative to equipment and systems implies temporary versus permanent disabling or deenergizing (e.g., disconnecting equipment from its source of power by an easily reversible method). Deactivation as a part of D&D&D has a more permanent connotation.

Structure. Elements that provide support or enclosure such as buildings, freestanding tanks, basins, dikes, and stacks.

System. Collection of components (see definition) assembled to perform a function such as the following systems: heating, ventilating, and air conditioning; control; utility; reactor cooling; or fuel storage.

Technical and functional requirements. Design input used to (1) identify the purpose and need for new structures, systems, and components (SSC) or a modification to an existing SSC, (2) provide a general description of objectives, (3) describe functional requirements (see definition) with associated bases, (4) identify performance requirements (see definition), and (5) establish the applicable design criteria at the level of detail necessary to proceed with the design.

Transuranic. Those elements with an atomic number greater than that of uranium (i.e., atomic number greater than 92).

Transuranic waste. Generally, without regard to source or form, waste that is contaminated with alpha-emitting transuranic isotopes with half-lives greater than 20 years and concentrations greater than or equal to 100 nCi/g of waste at the time of assay. At the Idaho National Engineering and Environmental Laboratory (INEEL), waste containing Ra-225 and U-233 are included as transuranic waste.

Waste zone material. The 57 to 96 m^3 (75 to 125 yd^3) of waste and interstitial soil removed from the OU 7-10 Glovebox Excavator Method Project excavation area between the overburden and underburden.

Technical and Functional Requirements for the OU 7-10 Glovebox Excavator Method Project

1. INTRODUCTION

The *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho* (DOE-ID 1993) specifies environmental remediation of transuranic (TRU) waste from the Waste Area Group (WAG) 7 Operable Unit (OU) 7-10, which comprises Pit 9, within the Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering and Environmental Laboratory (INEEL). On October 1, 2001, the INEEL published the *Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications* (INEEL 2001) that identifies a path forward for a waste retrieval demonstration that demonstrates a feasible approach for retrieving waste from OU 7-10. The OU 7-10 Glovebox Excavator Method Project was established to accomplish the objectives presented in that report. The overall objectives for the project are listed below:

- Demonstrate waste zone material retrieval
- Provide information on any contaminants of concern present in the underburden
- Characterize waste zone material for safe and compliant storage
- Package and store waste zone material onsite, pending a decision on final disposition.

The requirements presented in this technical and functional requirements (T&FR) document establish the technical baseline for the project and link the requirements presented in the following documents:

- 1993 OU 7-10 (Pit 9) Record of Decision (ROD)
- *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering Laboratory* (DOE-ID 1995)
- *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1998)
- Appendix A of the *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: Operable Unit OU 7-10 (Pit 9 Project Interim Action)* (LMITCO 1997).

Design, procurement, construction, testing, operation, safe shutdown, layup, and deactivation, decontamination, and decommissioning shall be based on the requirements listed in this document.

This project is requested by the U.S. Department of Energy Idaho Operations Office (DOE-ID) in support of the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991), the OU 7-10 ROD (DOE-ID 1993), and Appendix A of the *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan* (LMITCO 1997).

1.1 Facility Modification Identification

The INEEL is a U.S. Department of Energy (DOE) facility located 52 km (32 mi) west of Idaho Falls, Idaho, that occupies 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Idaho Snake River Plain. The RWMC is located in the southwestern portion of the INEEL. The Subsurface Disposal Area (SDA) is a 39-ha (97-acre) area located in the RWMC. Waste Area Group 7 is the designation for the RWMC recognized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC § 9601 et seq.) and the Federal Facility Agreement and Consent Order (DOE-ID 1991), which encompasses the SDA buried waste site. Waste Area Group 7 has been subdivided into13[a] OUs. Pit 9, designated OU 7-10, is located in the northeast corner of the SDA. The OU 7-10 site is an area into which chemicals, radioactive materials, and sludge from DOE weapons plants and other government programs were disposed. While such disposal at the RWMC began in 1952, OU 7-10 was used and filled in the late 1960s. The pit contains the following waste types: characteristic hazardous, listed hazardous, low-level radioactive, and TRU.

The project facilities and processes will be designed to safely conduct a waste zone material retrieval demonstration in a selected area of OU 7-10. The project processes consist of excavation and retrieval; sampling, packaging, and storage; shutdown; deactivation, decontamination, and decommissioning (D&D&D); safeguards and security; and environmental monitoring. Project facilities include a Weather Enclosure Structure (WES), Retrieval Confinement Structure (RCS), Packaging Glovebox System (PGS), and ventilation system.

1.2 Limitations of the Technical and Functional Requirements Document

This T&FR document defines the requirements for this project. It is not intended to define analysis or evaluation tasks that may be performed as part of the design activity. Requirements that are not yet completely defined will contain "TBD" (to be determined) within the requirement statement. Resolution of these TBDs will be made through identified actions that will be tracked to closure in the project action tracking system.

This T&FR document captures overall project design requirements but does not include detailed design criteria. Detailed design criteria will be captured in summary system design criteria documents.

1.3 Ownership of the Technical and Functional Requirements Document

This T&FR document is the product of the combined activities of the project team. The project engineer has ultimate responsibility for the content and approval of this document. Updates to the T&FR document will be processed in accordance with INEEL procedures.

1.4 Requirement Verification

Verification of the requirements contained in this document will be performed to ensure that each requirement has been met. Initial requirement verification will be accomplished by review or analysis

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a. Operable Units 13 and 14 were combined into the comprehensive remedial investigation and feasibility study in 1995 (Huntley and Burns 1995).

using the design output documents (i.e., drawings, specifications, and engineering design files) available at Critical Decision 2/3. This verification will provide assurance that the finished design is valid and complete and will be documented in a standalone matrix. Requirement verification methods, therefore, are no longer tracked within the body of this T&FR document.

In addition, follow-on requirement verification is planned to occur as documented in "Integrated Acceptance Test/Turnover Plan for the OU 7-10 Glovebox Excavator Method Project (Draft)."[b] Although PLN-1113 draws from the standard set of verification methods (i.e., analysis, demonstration, inspection, review, and test), as applicable and appropriate, for the verification of T&FRs, its primary purpose is to identify requirements to be verified through testing. Verification of testable requirements will be performed using a variety of test types including but not limited to vendor, construction checkout, mockup, system operation, and integrated testing. These tests, as well as the other verification methods, provide assurance that the project structures, systems, and components (SSCs) will function as required and meet expected performance levels.

1.5 Change Log

Changes from Revision 2 to Revision 3 of this T&FR document are contained in Appendix A, "Technical and Functional Requirements Document Change Log—From Revision 2 to Revision 3."

b. PLN-1113, 2002, "Integrated Acceptance Test/Turnover Plan for the OU 7-10 Glovebox Excavator Method Project (Draft)," Rev. A, September 2002, or current revision after issuance.

2. OVERVIEW

2.1 Facility Structure, System, and Component Functions

The OU 7-10 Glovebox Excavator Method Project includes retrieving, packaging, and safely storing waste zone material from a selected area of OU 7-10. The facilities for the project will be located in the selected area of OU 7-10. The retrieval system consists of a WES, RCS, excavator, ventilation system, and other supporting equipment. The PGS consists of three gloveboxes in which operators examine retrieved materials, take samples, and package waste zone material. The storage system includes provisions for drum assay and storing packaged waste zone material both with and without polychlorinated biphenyl (PCB) contamination.

The major SSCs required for the project and the functions they must perform are listed below:

- Retrieval system
  - A WES to provide weather protection for workers, equipment, and the RCS
  - An RCS to provide confinement of the area to be excavated
  - An excavator to retrieve soil and waste zone material, and sample the underburden
  - A ventilation system to maintain the confinement system and gloveboxes at a lower pressure than the surrounding WES and ensure that air flows from the outside to the inside of the RCS to confine contamination.
- Material packaging system
  - Three gloveboxes to package waste zone material and use for examining, sampling, and packaging functions
  - A fissile material monitor at each glovebox to assist operators in controlling the amount of fissile material loaded into each drum.
- Storage system
  - An assay operation to monitor drum contents to determine the concentration of TRU material and the amount of fissile material in each drum
  - Toxic Substances Control Act (TSCA) (15 USC § 2601 et seq.) -compliant storage for materials containing PCB-contaminated waste
  - Storage for packaged materials without PCB contamination.

2.2 Facility Structure, System, and Component Classification

Safety-significant SSCs are identified in accordance with DOE-ID Order 420.D, "Requirements and Guidance for Safety Analysis." No safety-class SSCs were identified. Safety significant SSCs will meet Performance Category (PC) -2 criteria for natural phenomena hazards.

2.3 Operational Overview

The project includes retrieval, packaging, and storage systems. The excavation site contains 15-cm (6-in.) diameter probes that were inserted to the point of refusal during Stage I of the OU 7-10 Staged Interim Action Project. These probes will be left in place during waste zone material retrieval to the extent practicable. Overburden will be excavated and packaged before disturbing waste zone material.

Waste zone material will be retrieved with a manned excavator. The operator will be located in the WES outside the RCS. The excavator arm contained within the RCS will excavate an angular swath and the retrieved material in the excavator bucket will be placed in a transfer cart. One transfer cart will be located at the entrance to each of the three material packaging gloveboxes. The carts will transport the waste zone material inside the gloveboxes where it will be inspected, sampled, and packaged. Packages of waste zone material will be placed in safe and compliant storage.

After waste zone material excavation is complete, samples of the underburden will be taken and the pit will be backfilled for shutdown before the D&D&D phase.

3. REQUIREMENTS AND BASES

3.1 Functional and Performance Requirements

This section contains requirements that specify what the design solution must do (functional requirements) and how well functions must be performed (performance requirements) for the OU 7-10 Glovebox Excavator Method Project.

3.1.1 Facility or System

This section contains the functional and performance requirements necessary to meet the functional statements made in Section 2.1.

3.1.1.1 Retrieval System

3.1.1.1-1. The project shall provide a weather enclosure for the work area around the confinement.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description.

3.1.1.1-2. The project shall provide a confinement for radiological and hazardous materials.

Basis: DOE Order 420.1, "Facility Safety," and WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Retrieval System. The PGS and the building that covers the retrieval area (the RCS) form the confinement. The weather enclosure that covers the confinement is not considered a confinement.

3.1.1.1-3. The project shall conduct one retrieval campaign.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 1.3, Background. Applications reduced from five to one. There will be no relocations of the system.

3.1.1.1-4. The project waste zone material excavation volume shall be between 57 and 96 m^3 (75 and 125 yd^3) of waste zone material.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Sections 2.1, Recommended Approach, and 4.3.1, Modification Description.

3.1.1.1-5. The project shall include a ventilation system to provide defense-in-depth for confinement of airborne radiological and hazardous materials.

Basis: DOE Handbook, DOE-HDBK 1132-99, "Implementation Guide for Use in Developing Documented Safety Analysis to Meet Subpart B of 10 CFR 830," a handbook associated with DOE Order 420.1, "Facility Safety," states: "The design of a confinement ventilation system ensures the desired airflow at all times and specifically when personnel access doors or hatches are open. When necessary, air locks or enclosed vestibules may be used to minimize the impact of open doors or hatches on the ventilation system and to prevent the spread of airborne contamination within the facility."

3.1.1.2 Material Packaging System

3.1.1.2-1. The project shall characterize, package, and store waste zone material that has been retrieved.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements.

3.1.1.2-2. The project shall package samples obtained during retrieval and packaging activities for subsequent analysis.

Basis: Sampling is required to support characterization of waste zone material.

3.1.1.2-3. The project shall provide ventilation as defense-in-depth to confine airborne radiological and hazardous materials during waste zone material characterization and packaging.

Basis: DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees" states: "For hazards identified either in the facility design or during the development of procedures, controls shall be incorporated in the appropriate facility design or procedure." The inclusion of a ventilation system in the design provides for engineering control of airborne radiological and hazardous materials during waste zone material characterization and packaging.

3.1.1.3 Storage System

3.1.1.3-1. The project shall characterize retrieved waste zone material for safe storage.

Basis: Stage II objective. WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements. There are a number of applicable or relevant and appropriate requirements (ARAR) requirements that apply to storage that must be met (i.e., Resource Conservation and Recovery Act [RCRA]; Toxic Substances Control Act [TSCA]; and DOE Order 435.1, "Radioactive Waste Management").

3.1.1.3-2. The project shall be capable of compliant storage of Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and radioactive waste in accordance with substantive requirements of applicable or relevant and appropriate requirements (ARARs).

Basis: There are a number of ARAR requirements that apply to storage that must be met (i.e., Resource Conservation and Recovery Act [RCRA]; Toxic Substances Control Act [TSCA]; and DOE Order 435.1, "Radioactive Waste Management"). The requirements affect the required facility (containment requirements), waste handling (separation of incompatibles), packaging, and emergency equipment, as clarified in EDF-3032, *OU 7-10 Glovebox Excavator Method Project Storage Requirements and Approach.*

3.1.2 Systems, Subsystems, and Major Components

This section contains the functional and performance requirements that are unique to subsystems and major components.

3.1.2.1 Excavation and Retrieval

3.1.2.1-1. The project shall remove overburden from the selected retrieval area before beginning waste zone material retrieval.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Process Description. The angular area will be braced with a vertical-side shoring box. The excavation system will remove overburden as practical contained within this shoring box.

3.1.2.1-2. The project shall remove the overburden in a manner that is protective of the environment, community, and workers.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3, Process Description. Overburden will be removed to a specified depth.

3.1.2.1-3. The project shall remove waste zone material from the selected plot in OU 7-10.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.4, Risk Estimate, Table 4.3-8. Waste zone material includes waste and interstitial soil. The Glovebox Excavator Method Project site will be selected to avoid the known large object exceptions. Volume and mass limitations are based on equipment that will be used (routine use) for mass handling, and volume capacity as described in the WAG 7 Analysis of OU 7-10 Stage II Modifications Report. The volume of waste zone material removed from the selected plot in OU 7-10, as well as the surface area of the underburden, will be limited by the naturally occurring angle of repose that can be achieved in the pit excavation.

3.1.2.1-4. The project shall be capable of retrieving waste from deteriorated waste containers.

Basis: Waste from the OU 7-10 Glovebox Excavator Method excavation zone must be retrieved.

3.1.2.1-5. The project shall be capable of differentiating between overburden, waste zone material, and underburden.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach; 4.1.5, Risk Analysis; 4.2.1, Recommended Approach; 4.3.1, Process Description; and Figure 4.3-2. Generally, overburden will be removed to a depth of 1 to 1.1 m (3 to 3.5 ft) as described in the *Excavation Plan and Sequential Process Narrative for the OU 7-10 Glovebox Excavator Method Project* (INEEL/EXT-02-00703). The remaining overburden will be considered waste zone material. The level of the underburden will be considered reached when no more debris is encountered.

3.1.2.1-6. The project shall use methods and techniques to minimize the spread of contamination from waste zone material into the overburden and underburden material.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3, Process Description.

3.1.2.1-7. The project shall be capable of controlling the dust generation within the confinement.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description. Dust lowers visibility and spreads airborne contamination; it therefore must be mitigated.

3.1.2.1-8. The project shall correlate excavator scoops with pit zones and drum numbers with an accuracy of plus or minus 1 m (3 ft).

Basis: Agreement from April 30, 2002 meeting, "OU 7-10 Glovebox Excavator Method Project Integrated Planning of Excavation, Drumming, and Sampling." Request originating from November 8, 2001 Bechtel BWXT Idaho, LLC; DOE; U.S. Environmental Protection Agency (EPA); and Idaho Department of Environmental Quality weekly telephone call. The following information was provided in response to agency comments regarding XYZ traceability in December 2001: "The project does not have a commitment to specific XYZ traceability, as did the previous 90 percent Stage II design. It must be understood that the value of this information at lower elevations may be quite limited, due to material sloughing off the sidewalls into the bottom of the excavation, as influenced by the natural angle of repose of the material. Horizontal travel of the bucket during load movement will also spread waste from one location to another."

3.1.2.2 Material Handling

3.1.2.2-1. The project shall segregate overburden soil from waste zone material.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Figure 4.3-2 identifies excavating and packaging overburden before disturbing the waste. The intent is to prevent cross contamination of waste into the overburden.

3.1.2.2-2. The project shall be capable of conveying contained liquids, sludges, and solids between process areas.

Basis: The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach, identifies separate process areas for retrieval of waste versus sampling and packaging the waste. Process areas can include, but are not limited to, retrieval, material processing, packaging, and storage areas. It is permissible to transfer material in containerized batches.

3.1.2.2-3. The project shall provide limited capability to reduce the size of retrieved waste to allow placement in waste containers suitable for storage.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001. The material packaging system described on page 4-22 of the report includes a box for packaging items too large to fit into a 55-gal drum. The report also discusses on page 4-5 under "Drum or Box" Packaging - waste that cannot be reduced in size will be left in place. The current design uses an 85-gal drum for oversized waste instead of a box.

3.1.2.2-4. The project shall stabilize any retrieved visible uncontained free liquid before packaging.

Basis: The INEEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC) requires that waste contain as little residual liquid as is reasonably

achievable including (1) internal containers that contain no more than 1 in. of liquid in the bottom and (2) total residual liquid in the final waste container does not exceed 1% by volume of that container (i.e., 1/2 gal per 55 gal drum). The criticality safety evaluation also requires that liquid be stabilized when encountered to reduce availability of moderator.

3.1.2.3 Sampling and Analysis

3.1.2.3-1. The project shall take samples to support characterization of waste zone materials placed in containers that are going into storage.

Basis: The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001. This characterization is for safe and compliant storage including waste determination appropriate for the storage location.

3.1.2.3-2. The project shall include a sample tracking process.

Basis: The sample tracking process includes logging and tracking samples and associating the sample to the source material.

3.1.2.3-3. The project shall provide data to determine contaminants in the underburden.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Sections 2.1, Recommended Approach; 3.3, Stage II Objectives and Requirements; 4.1.4, Risk Analysis; and 4.3.1, Process Description. Samples will be taken of the underburden, as defined by the project data quality objectives.

3.1.2.3-4. The project shall characterize samples of waste zone material for safe and compliant storage including waste determination appropriate to establish acceptability of associated waste drums to the INEEL RRWAC.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, as modified by the August 16, 2002, baseline change for onsite storage.

3.1.2.3-5. The project shall sample underburden below the retrieval area.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach; 4.3.1, Process Description; and Figure 4.3-2. The underburden will be sampled during the OU 7-10 Glovebox Excavator Method Project excavation.

3.1.2.4 Packaging

3.1.2.4-1. The project shall be capable of packaging material in 55- and 85-gal drums.

Basis: Standard waste containers include 55- and 85-gal drums. Safe and cost effective storage and transport of hazardous materials requires packaging in standard waste containers.

3.1.2.4-2. The project shall be capable of packaging in overpack waste containers for storage.

Basis: In the event that overpack is needed, the capability will exist to package intact waste containers.

3.1.2.4-3. The project shall be capable of packaging waste zone material in containers that meet the requirements of the INEEL RRWAC.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements, as modified by the August 16, 2002, baseline change for onsite storage. The recommended disposition of all waste zone material packages is transfer to an onsite facility for storage pending a decision on final disposition.

3.1.2.4-4. The project shall label the containers of packaged waste zone material in accordance with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements and the INEEL RRWAC.

Basis: The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, as modified by the August 16, 2002, baseline change for onsite storage. The project will characterize the waste zone material for safe and compliant storage and store waste in containers that are properly labeled.

3.1.2.5 Storage

3.1.2.5-1. The project shall be capable of storing overburden removed from OU 7-10 for future disposition.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description. Disposition of overburden soil is not yet finalized and several disposition paths exist. Final disposition will be based on existing overburden characterization data and on the results of an economic analysis. A storage capability is necessary since overburden soil removed to a mutually agreed upon depth may be returned to the excavation for reuse as overburden. Interstitial soil is handled as part of waste zone material.

3.1.2.5-2. The project shall be capable of storing overburden in a manner that prevents contamination from other materials.

Basis: From a waste management perspective, all-existing data (Lockheed Martin Advanced Environmental Systems [LMAES] sample data and Stage I type A probe data) and process knowledge information (e.g., original borrow source and method of emplacement) on the overburden soils leads to the conclusion that the overburden soils are appropriately managed as low-level waste. The low-level waste designation is only appropriate as long as overburden retrieval and handling prevents contamination from the waste or other materials.

3.1.2.5-3. The project shall be capable of storing overburden in a manner that prevents contamination of other materials or the environment.

Basis: The overburden contains trace levels of contamination based on Lockheed Martin Advanced Environmental Systems (LMAES) sampling in 1995. The contamination limits are defined in Table 2-2 of *Manual 15A – INEEL Radiological Control*. Requirements for confinement during handling and storage are defined in Chapter 3 of the same manual.

3.1.2.5-4. The project shall be capable of storing retrieved waste zone material for future disposition.

Basis: The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001.

3.1.3 Boundaries and Interfaces

This section contains the functional, physical, and performance boundary requirements of the system.

3.1.3-1. The project shall use, where available, commercial equipment and products.

Basis: These items are readily available, and have shorter delivery times, known reliabilities, spare parts available, and lower cost.

3.1.3-2. The project shall utilize the services that are available from RWMC and INEEL.

Basis: "Services" refers to RWMC and INEEL capabilities such as the Idaho Nuclear Technology and Engineering Center Analytical Lab, RWMC Stored Waste Examination Pilot Plant, RWMC storage buildings, and INEEL transportation.

3.1.3-3. The project shall use, where available, existing utilities.

Basis: The intent of using existing utilities is to be cost effective by minimizing new construction, recognizing that additional utility services may be required if the processes and equipment are used for follow-on implementation at a later date.

3.1.4 Codes, Standards, and Regulations

Codes, standards, and regulations that will be applied to the system are referenced in Section 4, References.

3.2 Special Requirements

This section contains requirements that are not necessary to ensure that the system is functional, but affect the system design and are imposed to eliminate or mitigate the effects of hazards and natural phenomenon and to make the system more user friendly.

3.2.1 Radiation and Other Hazards

This section contains those design safety feature requirements that are related to radiation and other hazards that are beyond those typically covered by Occupational Safety and Health Administration

(OSHA) in an industrial work place. They are limited to the radiological requirements associated with specific numerical exposure limits.

3.2.1-1. The project shall be capable of handling waste that measures up to 200 mR/hour on contact with the outer container.

Basis: Idaho National Engineering Laboratory, *Comparison of the Pit 9 Project Inventory of Contaminants Against the Corresponding Portion of the Historical Data Task Inventory, and Recommended Revised Quantities*, January 1996, INEL-96/0055, Rev. 0. This report establishes that the target Rocky Flats waste was all contact-handled. Contact-handled TRU waste, by definition, is less than 200 mR/hour.

3.2.2 As Low as Reasonably Achievable

This section contains radiation requirements for which as low as reasonably achievable (ALARA) objectives or cost benefit form the bases. The associated issues include design safety features, equipment protection, and alarm and monitoring equipment. This section is not used for a discussion of the ALARA program, but for ALARA-related requirements that are system specific.

3.2.2-1. The project shall apply as low as reasonably achievable (ALARA) principles of exposures to materials (radioactive or hazardous) to ensure worker safety.

Basis: DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees"; and 10 CFR 835, "Occupational Radiation Protection," Subpart K, "Design and Control."

3.2.2-2. The project shall ensure that the individual worker radiation exposure dose is less than the administrative control limit of 0.7 rem (700 mrem) per year.

Basis: 5 rem (5,000 mrem) is required by Agency documents, while 0.7 rem (700 mrem) is the limit established in accordance with the INEEL Radiological Control Manual, Article 211.2.

3.2.2-3. The project shall protect against human exposure to radiation, airborne radionuclides, and hazardous chemicals during the project operations.

Basis: To be protective, exposure limits must be less than or equal to the American Conference of Government Industrial Hygienists threshold limit values, Occupational Safety and Health Administration (OSHA) permissible exposure levels, or National Institute for Occupational Safety and Health recommended exposure levels, whichever is less. DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees"; and 10 CFR 835, "Occupational Radiation Protection."

3.2.3 Nuclear Criticality Safety

This section contains design feature requirements related to averting nuclear criticality.

3.2.3-1. The project shall ensure that the probability of a criticality is less than extremely unlikely.

Basis: Controls will be implemented to ensure criticality does not occur. These include monitoring fissile loading for some waste matrices to ensure that overloading does not occur (see 3.2.3-2 below) and limiting operations in the presence of unsafe quantities of moderator. Controls are necessary since criticality cannot be deemed incredible as described in *Preliminary Documented Safety Analysis for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-01-01474, Rev. 0, April 2002.

3.2.3-2. The project shall ensure that drums are not overloaded relative to the fissile content of the final package.

Basis: The overloaded fissile material limit is 380 fissile gram equivalent (FGE) per drum, with the operational limit set at 200 FGE. Some waste streams will be identifiable through process knowledge and should not produce overloaded drums. Other waste streams need to be monitored as drums are loaded to ensure compliance with fissile loading limits. Certain waste streams, if overloaded, lead to difficult operational recovery processes in order to be repackaged. The reference for the basis for the 380-FGE limit is 75% of the minimum critical system for Pu-239 systems, in accordance with PRD-112, "Criticality Safety Program Requirements Manual." The basis for the 200-FGE limit is the INEEL RRWAC.

3.2.3-3. The project shall make provisions for determining, after packaging, the fissile content of all drummed waste zone material.

Basis: To meet onsite storage WAC, fissile content of the drums must be determined before storage (reference: INEEL RRWAC).

3.2.3-4. The project shall provide a criticality alarm system.

Basis: A criticality alarm is necessary because a criticality event cannot be deemed an incredible event as described in the *Preliminary Documented Safety Analysis for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-01-01474, Rev. 0, April 2002, and DOE Order 420.1, "Facility Safety."

3.2.4 Industrial Hazards

This section contains design Environmental, Safety, and Health requirements related to personnel safety and Occupational Safety and Health Administration considerations.

3.2.4-1. The project shall ensure protection of workers in accordance with 29 CFR 1910, "Occupational Safety and Health Standards," or equivalent.

Basis: Compliance with 29 CFR 1910 is a regulatory and contractual requirement. The project industrial hygienist and safety engineer will perform regular assessments of the work area during operations to ensure compliance with 29 CFR 1910, "Occupational Safety and Health Standards." The project industrial hygienist will conduct monitoring for hazardous constituents using portable monitoring equipment to verify protection of workers in accordance with the exposure requirements in 29 CFR 1910 or equivalent.

3.2.5 Operating Environment and Natural Phenomena

This section contains requirements related to normal operating, standby, and storage environmental conditions, as well as those related to operational capability and equipment protection during and after abnormal and accident conditions and extraordinary natural phenomenon conditions.

3.2.5-1 The project shall be designed to withstand the effects of INEEL climate and natural phenomena in accordance with the DOE-ID *Architectural Engineering Standards*.

Basis: The documented safety analysis assumes that the weather enclosure structure (WES) is designed for Performance Category (PC) -2 wind loads and that the retrieval confinement structure (RCS) and packaging glovebox system (PGS) are designed for PC-2 seismic loads. DOE orders, executive orders, and applicable codes require occupied areas to be designed for earthquake loads. The project is required to design for the local effects of storm water. Larger scale flooding will be handled by the existing Radioactive Waste Management Complex (RWMC) flood control and drainage system.

3.2.5-2. The project shall be capable of resisting limited subsidence of the pit surface.

Basis: The design must take into account subsidence and angle of repose.

3.2.6 Human Interface Requirements

This section contains requirements that enhance the interface between system and human operator.

3.2.6-1. The project shall be operated by workers located outside the confinement during waste zone material retrieval.

Basis: WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Sections 1.1 Recommendation; 2.1, Recommended Approach; 4.3, Glovebox Excavator Method; 4.3.1, Modification Description; and Table 4.3.5. Performance without requiring personnel access to the excavation pit or entry into the confinement during system operation is preferred based on reducing the risk of chemical or radioactive exposure and to reduce the potential for physical injury to workers.

3.2.6-2. The project shall provide restrooms, personnel monitoring areas, and other administrative or support areas as necessary.

Basis: Personnel must be provided a safe and healthy work environment. Offices, lunchrooms, showers, and locker rooms will not be provided as part of the new structures. No permanent change room facilities will be constructed; however, facilities will be provided as identified in the health and safety plan. Emergency support areas will be available.

3.2.6-3. The project shall maintain lighting levels adequate to support operations.

Basis: Adequate lighting is needed for safe operations.

3.2.6-4. The project shall maintain temperatures that allow normal equipment operation inside the confinement.

Basis: Temperature in the facility must not fall below a point at which the equipment will not be able to be operated. All equipment will operate satisfactorily if the comfort zone temperatures required by section 1550 of the DOE-ID *Architectural Engineering Standards* are met.

3.2.7 Environmental Management

This section contains requirements that ensure environmental compliance.

3.2.7-1. The project shall control releases of hazardous and radioactive effluents to the environment within the limits referenced in DOE 5400.5, "Radiation Protection of the Public and the Environment" and the National Contingency Plan (NCP).

Basis: The primary long-term objective is to provide for long-term protection of human health and the environment; it is also important to provide for the short-term safety and health of the environment, community, and workers. This is to include the short-term risk assessment as per the NCP.

3.2.7-2. The project shall maintain releases of radioactive materials to the environment and community within acceptable limits as defined by 40 CFR 61, "National Emission Standards For Hazardous Air Pollutants," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities."

Basis: Provides for protection of human health and the environment.

3.2.7-3. The project shall provide data on short-term risk to workers for project operations.

Basis: The *Air Emissions Evaluation for the OU 7-10 Glovebox Excavator Method Project* (EDF-2322) documents estimated short-term risk from project operations to appropriate receptors. No other data collection for short-term Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) risk evaluation is required. Based on EPA guidance in "Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual," Part C, "Risk Evaluation of Remedial Alternatives," PB92-963334, Publication 9285.7-01C (EPA 1991), "short-term risks" are defined as - "Risks that occur during implementation of a remedial alternative. Some 'short-term' risks can occur over a period of many years (e.g., risk associated with air stripper emissions)." As a result of this definition, the risks are those that result from hazardous chemical or radionuclide exposures. The past Stage II INEEL CERCLA assessments have limited the short-term risk evaluation to a collocated worker receptor (e.g., at an assumed 100-m [328-ft] distance) and the maximally exposed individual for a public receptor scenario. Actual remediation workers (not the collocated worker) involved in OU 7-10 cleanup are assumed to be protected through DOE and Occupational Safety and Health Administration (OSHA) standards and do not require evaluation in the short-term risk assessment. The *Preliminary Documented Safety Analysis for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-01-01474, Rev. 0, April 2002, evaluates risk of exposures during accident conditions to the remediation workers (qualitative), collocated workers (qualitative and quantitative), and offsite public (qualitative and quantitative). Chapters 7 and 8 of the final documented safety analysis

will provide an estimate of the annual worker doses to radiological and nonradiological workers during normal operations.

3.2.8 Existing Subsurface Probes

This section contains requirements that address the probes that were installed during Stage I of the OU 7-10 Staged Interim Action Project.

3.2.8-1. The design and operational plans for the project shall take into account the presence of probes in the planned excavation area, and in the vicinity of the excavation.

Basis: Subsurface probes were placed in the Subsurface Disposal Area (SDA) during Stage I activities.

3.3 Engineering Design Requirements

This section contains the general engineering design requirements that apply to the OU 7-10 Glovebox Excavator Method Project. More detailed design criteria will be developed as necessary.

3.3.1 Architectural, Civil, and Structural

This section contains the requirements for typical facility requirements based on codes, as well as requirements that address issues related to dynamic loads, operational and live loads, dead weight loads, and the facility's physical support of equipment and systems.

3.3.1-1. The project shall provide for entry and removal of materials and equipment while preventing releases of radioactive and hazardous contaminants above the threshold limits to the environment.

Basis: DOE Order 5400.1, "General Environmental Protection Program"; DOE Order 5400.5, "Radiation Protection of the Public and the Environment"; and the National Contingency Plan (NCP).

3.3.1-2. The project shall provide the capability for personnel entry into the confinement for non-routine activities.

Basis: Access is needed for occasional activities such as maintenance of the excavator bucket.

3.3.1-3. The excavator system shall be capable of lifting and moving design load weights of up to 454 kg (1,000 lb).

Basis: This includes intact waste containers that are empty or contain TRU, low-level, mixed, and hazardous waste material. The 454-kg (1,000-lb) weight is based on lifting a 55-gal drum of solidified materials.

3.3.1-4. The retrieval transfer cart shall be capable of accepting design load weights up to 159 kg (350 lb).

Basis: The retrieval transfer cart weight limits cannot exceed those acceptable for the glovebox. While the excavator is capable of handling larger loads, the glovebox (and thus

the retrieval transfer cart) requires a lower weight limit for safety and hazard considerations. For safety reasons, handling 454-kg (1,000-lb) drums in the gloveboxes presents unacceptable risks to the workers (finger, hand, wrist, and arm injuries). For hazard considerations, handling 454-kg (1,000-lb) drums in the gloveboxes poses a higher risk of load slippage and breach of the windows.

3.3.1-5. The packaging glovebox system shall be capable of handling design load weights up to159 kg (350 lb).

Basis: While the excavator is capable of handling larger loads, the glovebox requires a lower weight limit for safety and hazard considerations. For safety reasons, handling 454-kg (1,000-lb) drums in the gloveboxes presents unacceptable risks to the workers (finger, hand, wrist, and arm injuries). For hazard considerations, handling 454-kg (1,000-lb) drums in the gloveboxes poses a higher risk of load slippage and breach of the windows.

3.3.2 Mechanical and Materials

Mechanical and material requirements for systems and components are covered by requirements in other sections.

3.3.3 Chemical and Process

Chemical and process requirements are covered by requirements in other sections.

3.3.4 Electrical

Electrical requirements are covered by the interface requirements in Section 3.1.3, Boundaries and Interfaces.

3.3.5 Instrumentation and Control

This section contains system hardware-related instrumentation and control requirements and pertains to the instrumentation and control hardware that directly operates and controls the system.

3.3.5-1. The project shall monitor air inside the weather enclosure for radiological constituents to ensure protection of workers in accordance with 10 CFR 835, "Occupational Radiation Protection," or equivalent.

Basis: There is a weather enclosure structure (no secondary confinement) in the OU 7-10 Glovebox Excavator Method Project. However, operators in the weather enclosure will still need protection from radiological constituents.

3.3.5-2. The project shall monitor for emissions of radioactive contaminants to the environment.

Basis: In accordance with the project ARAR, 40 CFR 61.92 and 93, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities."

3.3.6 Information Management

This section contains requirements related to information management.

3.3.6-1. The project shall be capable of recording and retrieving information generated during operations.

Basis: This information will be necessary to evaluate the retrieval process, determine the contents of the selected area, and determine the future disposition of the removed waste zone materials.

3.3.7 Fire Protection

This section contains requirements related to fire detection, suppression, and mitigation.

3.3.7-1. The project shall be designed, constructed, operated, and maintained in a manner that prevents fires and explosions.

Basis: DOE Order 420.1, "Facility Safety"; and NFPA 801-1998, "Standard for Fire Protection for Facilities Handling Radioactive Materials." The design must consider the operational aspects of the facility and their associated fire hazards and incorporate proper controls through sound design practice to minimize the potential for fire occurrences.

3.3.7-2. The project shall provide a fire protection system for the weather enclosure structure (WES), retrieval confinement structure (RCS), and the packaging glovebox system (PGS).

Basis: DOE Order 420.1, "Facility Safety."

3.3.7-3. The project shall be capable of detecting and suppressing design basis fire(s) as demonstrated by the fire hazard analysis (FHA).

Basis: DOE Order 420.1, "Facility Safety," defines requirements for mitigation of design basis as well as beyond design basis fires. It is a function of the FHA to identify the maximum credible and maximum possible fire losses associated with the facility and its operations and to assess the adequacy of the design, including fire protection systems, in mitigating the consequences to DOE-accepted levels.

3.3.7-4. The project shall be capable of mitigating the consequences of design basis fire(s) as demonstrated by the fire hazard analysis (FHA).

Basis: DOE Order 420.1, "Facility Safety," defines requirements for mitigation of design basis as well as beyond design basis fires. It is a function of the FHA to identify the maximum credible and maximum possible fire losses associated with the facility and its operations and to assess the adequacy of the design, including fire protection systems, in mitigating the consequences to DOE-accepted levels.

3.4 Testing and Maintenance Requirements

Requirements in this section are those related to the design of the system as opposed to operational testing and maintenance requirements.

3.4.1 Testability

3.4.1-1 The project shall consider features (e.g., attributes, components, and software) in the confinement system (e.g., PGS gloveboxes, glove ports, and RCS) that facilitate leak and pressure testing.

Basis: Best management practice, ALARA, and economic considerations. American Glovebox Society standards apply to the PGS gloveboxes and provide guidelines for allowable leak rates and testing methods.

3.4.1-2 The project shall consider features (e.g., attributes, components, and software) in the emissions monitoring system that facilitate testing for operability.

Basis: System inoperability could impact the requirements for emissions monitoring identified in DOE Order 5400.1, DOE Order 5400.5, and continuous and accurate radiological monitoring in accordance with 40 CFR Part 61.93 (NESHAPs). The design must, therefore, allow testing to ensure the system is operating properly and recording accurate data for radiological emissions reporting.

3.4.1-3 The project shall consider features (e.g., attributes, components, and software) in the fire detection, alarm, and suppression system, as well as in the life safety system, that facilitate testing for operability.

Basis: NFPA codes and OSHA regulations require periodic testing of these systems. The design must, therefore, include the testing features required by law and applicable codes to allow testing that ensures the systems are either (1) operating properly or (2) capable of proper operation when needed.

3.4.1-4 The project shall include the design and construction of mockup SSCs that allow testing of critical functions, processes, technology, and procedures as deemed necessary by project management.

Basis: Best management practice. Because of timely problem detection and related corrective actions, mockups can reduce the risk associated with critical equipment, processes, technologies, and procedures.

3.4.1-5 The project shall consider features (e.g., attributes, components, and software) in retrieval and operations support systems (e.g., FMM system, closed-circuit television system, PGS hoisting and rigging equipment, and dust suppression system) that facilitate testing for operability.

Basis: Best management practice and federal regulations (e.g., OSHA regulations apply to the testing of PGS hoisting and rigging equipment).

3.4.1-6 The project shall consider features (e.g., attributes, components, and software) in radiological and industrial safety systems (e.g., criticality alarm system as integrated, equipment emergency stops, light curtains, and associated control circuits) that facilitate testing for operability.

Basis: Best management practice and federal regulations (OSHA regulations apply industrial safety systems [e.g., the PGS light curtain and associated safety interlocks]).

The design, therefore, must allow testing that ensures these systems are either (1) operating properly or (2) capable of proper operation when needed.

3.4.1-7 The project shall consider features (e.g., attributes, components, and software) in ventilation and utility systems (e.g., electrical and standby power system, plant and breathing compressed air systems, heating and ventilating system, and the lighting system) that facilitate testing for operability.

Basis: Best management practice, federal regulations, and industry codes and standards.

3.4.2 [Reserved]

3.4.3 [Reserved]

3.4.4 Maintenance

This section contains requirements related to maintenance activities.

3.4.4-1. The project equipment located inside confinement shall be maintainable by glove port access (for equipment in gloveboxes) and by personnel entering the confinement in personal protective equipment (for equipment in the retrieval area).

Basis: The Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications report, Section 4.3.1, the last paragraph states that "workers may have to enter the confinement structure for repairs and maintenance."

3.5 Other Requirements

This section contains requirements not already addressed above.

3.5.1 Security and Special Nuclear Material Protection

This section contains requirements related to security and special nuclear materials protection.

3.5.1-1. The project shall manage Category 4 quantities of special nuclear materials used for calibrating project equipment.

Basis: DOE Order 474.1A, "Control and Accountability of Nuclear Materials"; and DOE Manual 474.1-1A, "Manual for Control and Accountability of Nuclear Materials."

3.5.1-2. The project shall record handling of excavated waste zone material in the glovebox trays on videotape.

Basis: The DOE and the OU 7-10 Glovebox Excavator Method Project agreed to use cameras located above the glovebox trays to record the excavated material in order to permit classification screening. (Meetings of March 14, 2002, and April 2, 2002.)

3.5.1-3. The project shall have the capability to store up to 3 days of glovebox videotapes in a secured manner.

Basis: Videotapes must be treated as DOE sensitive unclassified information until the INEEL Classification Office makes a classification determination. MCP-312, "Sensitive Unclassified Information Program," requires sensitive information be stored in a locked desk, cabinet, or room when not in use.

3.5.1-4. The project shall have the capability to associate the specific waste drums being processed with the corresponding glovebox videotape recordings.

Basis: If the INEEL Classification Office identifies a classified object on the videotapes, the specific drum containing the classified material must be retrievable from storage.

3.5.1-5. The project shall have security locks on gates and buildings to preclude unauthorized access to the area or operations.

Basis: MCP-303, "INEEL Access Controls."

3.5.2 Special Installation Requirements

Requirements related to special arrangements, locations, or installations of components are covered by requirements in other sections.

3.5.3 Reliability, Availability, and Preferred Failure Modes

This section contains (1) requirements related to design provisions that enhance reliability and availability and (2) failure mode analysis requirements.

3.5.3-1. The project shall be designed for an operating life of 6 months.

Basis: Based on estimated operations schedule with contingency. This is most likely to affect construction types of structures.

3.5.3-2. The project shall provide temporary facilities and equipment with a minimum design life of 2 years.

Basis: DOE-ID *Architectural Engineering Standards*, Appendix K, "Standard for Trailers, Modular Buildings and Relocatable Structures."

3.5.4 Quality Assurance

This section lists requirements associated with quality assurance activities.

3.5.4-1 The project shall apply quality controls commensurate with the risk, function, and importance of the system and its components.

Basis: 10 CFR 830, "Nuclear Safety Management," Subpart A, "Quality Assurance Requirements"; and ASME NQA-1-1997, "Quality Assurance Requirements for Nuclear Facility Applications."

3.5.5 Miscellaneous and General

This section contains any additional requirements that do not fit conveniently in other defined subsections.

3.5.5-1 The project shall maintain data records of each waste container packaged.

Basis: Per DOE Order 435.1, "Radioactive Waste Management"; and DOE Manual 435.1-1, "Radioactive Waste Management Manual," data records for all waste generated, treated, stored, transported, or disposed must be collected and maintained in accordance with DOE Order 200.1, "Information Management Program," and DOE Order 414.1, "Quality Assurance."

3.5.5-2. The project shall design all safety-significant structures, systems, and components (SSCs) to meet the safety function and functional requirements identified in the safety analysis.

Basis: Safety-significant SSCs must meet their functional requirements. The safety analysis identifies which SSCs are designated as safety-significant.

3.5.5-3. The project shall select, as practical, design and procedure options that minimize production of secondary waste in the retrieval, handling, and storage of soils and waste.

Basis: The INEEL environmental policy requires waste minimization and is documented in Program Description Document 1012, Rev. 7: "Integrate all efforts into project planning, design, and construction to minimize toxicity and volume of waste generated, conserve natural resources and energy, and minimize environmental impacts." In addition, DOE Order 5400.1, "General Environmental Protection Program" and DOE Order 435.1, "Radioactive Waste Management" require waste minimization efforts.

3.5.6 Facility Shutdown, Layup, and Deactivation, Decontamination, and Decommissioning

This section contains design and functional requirements related to the shutdown, layup, and D&D&D of project facilities and systems. Shutdown, layup, and D&D&D are the defined life-cycle phases that follow waste zone material retrieval and underburden sampling and lead up to final project closeout. Project closeout is as described in Section V, "Project Closeout," of GDE-70, "General Project Management Methods Guide."

3.5.6-1. The project shall stabilize the excavation site after waste zone material retrieval by backfilling the excavation.

Basis: The backfill prevents airborne spread of contamination, isolates the waste source term, and removes the physical dangers of an excavated hole in the ground. It is necessary to backfill the excavation in order to place the facility in safe shutdown.

3.5.6-2. The project shall place the project facilities in stable and known conditions for safe shutdown following completion of waste zone material retrieval and underburden sampling operations.

Basis: DOE Order 430.1A, "Life Cycle Asset Management," requires this to occur at shutdown before completion of mission activities. Facility conditions and system states after shutdown activities have occurred will (1) be protective of worker health and safety, the public, and the environment and (2) provide for cost-efficient activities during the layup (i.e., surveillance and maintenance) period.

3.5.6-3. The project shall maintain the project facilities in stable and known conditions during the layup period (after shutdown) until deactivation, decontamination, and decommissioning (D&D&D).

Basis: A short layup period after shutdown is anticipated during which plans are initiated and resources and processes are put in place to execute the D&D&D.

3.5.6-4. The project shall perform D&D&D of project facilities, systems, and components that are determined as nonessential to or obstructing OU 7-10 or WAG 7 missions.

Basis: Work Package Plan for OU 7-10 Glovebox Excavator Method Project - Safe Shutdown and D&D&D, Work Breakdown Structure (WBS) C.1.01.07.04.04.05, includes the assumption that D&D&D will occur as part of the project in fiscal year (FY) 2005.

3.5.6-5. The project shall include features in the design to facilitate D&D&D of project facilities and systems.

Basis: DOE G 435.1-1, "Crosswalk Tables DOE Order 5820.2A vs. DOE O 435.1/M 435.1-1."

4. REFERENCES FROM THE OU 7-10 RECORD OF DECISION DOCUMENT

The references listed in the sections below are ARARs and To Be Considered guidance from the OU 7-10 ROD (DOE-ID 1993).

4.1 Applicable or Relevant and Appropriate Requirements

40 CFR 61, Subpart H, 2002, Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Pollutants," Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 260, Title 40, "Protection of Environment," Part 260, "Hazardous Waste Management System: General," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61.92, 2002, Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Pollutants," Section 61.92, "Standard," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61.93, 2002, Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Pollutants," Section 61.93, "Emission Monitoring and Test Procedures," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61, Subpart H, Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Pollutants," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 261.3, 2002, Title 40, "Protection of Environment," Part 261, "Identification and Listing of Hazardous Waste," Section 261.3, "Definition of Hazardous Waste," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 264, Title 40, "Protection of the Environment," Part 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Activities," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 268, Title 40, "Protection of Environment," Part 268, "Land Disposal Restrictions," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 761, Title 40, "Protection of Environment," Part 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*, Office of the Federal Register (and as amended by *Federal Register* Volume 63, Number 124, Monday June 28, 1998, 35384 [cited in ESD of September 1998]).

IDAPA[c] 16.01.01.101,05.a, "Prevention of Significant Deterioration Increments for Sulfur Dioxide, " Idaho Administrative Procedures Act, Rules and Standards for Air Pollution Control, Idaho Department of Environmental Quality.

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c. Many of the IDAPAs were assigned different numbers since the OU 7-10 ROD (DOE-ID 1993) was written. The IDAPA references listed here are presented with the same numbers used in that ROD.

IDAPA 16.01.01.251 and 16.01.01.252, "Rules for Control of Fugitive Dust," Idaho Administrative Procedures Act, Rules and Standards for Air Pollution Control, Idaho Department of Environmental Quality.

IDAPA 16.01.01.502, "Emission Standards for Particulate Matter from Incinerators," Idaho Administrative Procedures Act, Rules and Standards for Air Pollution Control, Idaho Department of Environmental Quality.

IDAPA 16.01.05.004, "Hazardous Waste Management (HWM) System," Idaho Administrative Procedures Act, Rules and Standards for Hazardous Waste, Idaho Department of Environmental Quality.

IDAPA 16.01.05.005, "Identification and Listing of Hazardous Waste," Idaho Administrative Procedures Act, Rules and Standards for Hazardous Waste, Idaho Department of Environmental Quality.

IDAPA 16.01.05.008, "Operating Requirements for Incineration of Hazardous Waste," Idaho Administrative Procedures Act, Rules and Standards for Hazardous Waste, Idaho Department of Environmental Quality.

IDAPA 16.01.05.011, "Land Disposal Restriction (LDR) Treatment Standards," Idaho Administrative Procedures Act, Rules and Standards for Hazardous Waste, Idaho Department of Environmental Quality.

4.2 Record of Decision to Be Considered Guidance

40 CFR 300, 2002, Title 40, "Protection of Environment," Part 300, "National Oil and Hazardous Substances Pollution Contingency Plan," (NCP Final Rule 55 FR 8743, "Preamble"), *Code of Federal Regulations*, Office of the Federal Register.

DOE O 5400.5, 1993, "Radiation Protection of the Public and the Environment," U.S. Department of Energy, February 8, 1990; Change 2, January 7, 1993.

DOE O 5820.2A, 1988, "Radioactive Waste Management," U.S. Department of Energy, September 26, 1988. (Note: Cancelled by DOE Order 435.1, 1999, "Radioactive Waste Management," U.S. Department of Energy, July 9, 1999.)

EPA, 1990, *A Guide to Delisting of RCRA Wastes for Superfund Remedial Responses*, OSWER 9347.3-09FS, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response.

EPA, 1989, *Focus on Closure Requirements*, OSWER 9234.2-04FS, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response.

EPA, 1989, *Superfund LDR Guide #1, Overview of RCRA Land Disposal Restrictions (LDRs)*, OSWER 9347.3-01FS, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response.

5. REFERENCES

10 CFR 830, Subpart A, 2002, Title 10, "Energy," Part 830, "Nuclear Safety Management," Subpart A, "Quality Assurance Requirements," *Code of Federal Regulations*, Office of the Federal Register.

10 CFR 835, 2002, Title 10, "Energy," Part 835, "Occupational Radiation Protection," *Code of Federal Regulations*, Office of the Federal Register.

10 CFR 835, Subpart K, Title 10, "Energy," Part 835, "Occupational Radiation Protection," Subpart K, "Design and Control," *Code of Federal Regulations*, Office of the Federal Register.

29 CFR 1910, 2002, Title 29, "Labor," Part 1910, "Occupational Safety and Health Standards," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61, Subpart H, 2002, Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Pollutants," Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61.92, 2002, Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Pollutants," Section 61.92, "Standard," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 61.93, 2002, Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Pollutants," Section 61.93, "Emission Monitoring and Test Procedures," *Code of Federal Regulations*, Office of the Federal Register.

40 CFR 261.3, 2002, Title 40, "Protection of Environment," Part 261, "Identification and Listing of Hazardous Waste," Section 261.3, "Definition of Hazardous Waste," *Code of Federal Regulations*, Office of the Federal Register.

15 USC § 2601 et seq., 1976, "The Toxic Substances Control Act (TSCA) of 1976," *United States Code.*

42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code*.

Abbott, Michael L., 2002, *Air Emissions Evaluation for the OU 7-10 Glovebox Excavator Method Project*, Engineering Design File EDF-2322, Idaho National Engineering and Environmental Laboratory, Bechtel BWXT Idaho, LLC, Idaho Falls, Idaho.

ASME NQA-1-1997, 1997, "Quality Assurance Requirements for Nuclear Facility Applications," American Society of Mechanical Engineers.

Burton, Brent N., 2002, *OU 7-10 Glovebox Excavator Method Project Storage Requirements and Approach*, Engineering Design File EDF-3032, Rev. 0, Idaho National Engineering and Environmental Laboratory, Bechtel BWXT Idaho, LLC, Idaho Falls, Idaho.

DOE G 435.1-1, 1999, "Crosswalk Tables DOE Order 5820.2A vs. DOE Order 435.1" U.S. Department of Energy, July 9, 1999.

DOE-HDBK-1132-99, 2001, "Implementation Guide for Use in Developing Documented Safety Analysis to Meet Subpart B of 10 CFR 830," U.S. Department of Energy, October 24, 2001.

DOE-ID O 420.D, 2000, "Requirements and Guidance for Safety Analysis," U.S. Department of Energy Idaho Operations Office, July 17, 2000.

DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory,* Administrative Record No. 1088-06-29-120, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; Idaho Department of Health and Welfare.

DOE-ID, 1993, *Record of Decision: Declaration of Pit 9 at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory, Idaho Falls, Idaho*, Administrative Record No. 5569, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency Region 10; and State of Idaho Department of Health and Welfare.

DOE-ID, 1995, *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering Laboratory*, Administrative Record No. 5862, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; Idaho Department of Health and Welfare.

DOE-ID, 1998, *Explanation of Significant Differences for the Pit 9 Interim Action Record of Decision at the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory*, Administrative Record No. 10537, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; Idaho Department of Health and Welfare.

DOE-ID, 2001, *Architectural Engineering Standards*, Rev. 28, U.S. Department of Energy Idaho Operations Office, Idaho Falls, Idaho, URL: http://www.inel.gov/publicdocuments/doe/archeng-standards.

DOE M 435.1-1, 1999, "Radioactive Waste Management Manual," U.S. Department of Energy, July 7, 1999.

DOE O 200.1, 1996, "Information Management Program," Rev. 0, September 30 1996.

DOE O 414.1A, 2001, "Quality Assurance," U.S. Department of Energy, July 12, 2001.

DOE O 420.1, 2000, "Facility Safety," U.S. Department of Energy, Change 3, November 22, 2000.

DOE O 430.1A, 1998, "Life Cycle Asset Management," U.S. Department of Energy, October 14, 1998.

DOE O 435.1, 2001, "Radioactive Waste Management," U.S. Department of Energy, August 28, 2001.

DOE O 440.1A, 1998, "Worker Protection Management for DOE Federal and Contractor Employees," U.S. Department of Energy, March 27, 1998.

DOE O 474.1A, 2000, "Control and Accounting of Nuclear Materials," U.S. Department of Energy, November 20, 2000.

DOE O 5400.1, 1990, "General Environmental Protection Program," Change 1, U.S. Department of Energy, June 29, 1990.

DOE O 5400.5, 1993, "Radiation Protection of the Public and the Environment," U.S. Department of Energy, January 7, 1993.

DOE O 5820.2A, 1988, "Radioactive Waste Management," U.S. Department of Energy, September 26, 1988. (Note: Cancelled by DOE Order 435.1, 1999, "Radioactive Waste Management," U.S. Department of Energy, July 9, 1999.)

DOE M 474.1-1A, 2000, "Manual for Control and Accountability of Nuclear Materials," U.S. Department of Energy, November 22, 2000.

EPA, 1991, *Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual,* Part C, "Risk Evaluation of Remedial Alternatives," EPA/540/R-92/004, OSWER Directive 9285.7-01C, NTIS PB92-963334, U.S. Environmental Protection Agency, Interim Office of Emergency and Remedial Response, Washington, D.C.

Huntley, R. M., and D. E. Burns, 1995, *Scope of Work for Operable Unit 7-13/14 Waste Area Group 7 Comprehensive Remedial Investigation/Feasibility Study,* INEL-95/0253, Idaho National Engineering and Environmental Laboratory, Lockheed Martin Idaho Technologies Company, Idaho Falls, Idaho.

INEEL, 2002, *Preliminary Documented Safety Analysis for the OU 7-10 Glovebox Excavator Method Project*, INEEL/EXT-01-01474, Rev. 0, Idaho National Engineering and Environmental Laboratory, Bechtel BWXT Idaho, LLC, Idaho Falls, Idaho.

INEEL, 2001, *Waste Area Group 7 Analysis of OU 7-10 Stage II Modifications*, INEEL/EXT-01-01105, Rev. 0, Idaho National Engineering Laboratory, Bechtel BWXT Idaho, LLC, Idaho Falls, Idaho.

INEEL, 1996, *Comparison of the Pit 9 Project Inventory of Contaminants Against the Corresponding Portion of the Historical Data Task Inventory, and Recommended Revised Quantities*, INEL-96/0055, Rev. 0, Idaho National Engineering Laboratory, Idaho Falls, Idaho.

LMITCO, 1997, *Remedial Design/Remedial Action Scope of Work and Remedial Design Work Plan: Operable Unit OU 7-10 (Pit 9 Project Interim Action)*, INEL-94/0110 (formerly EGG-ER-11055), Rev. 2, Idaho National Engineering and Environmental Laboratory, Lockheed Martin Idaho Technologies Company, Idaho Falls, Idaho.

MCP-303, 2000, "INEEL Access Controls," Rev. 4, June 27, 2000.

MCP-312, 2001, "Sensitive Unclassified Information Program," Rev. 8, October 15, 2001.

NFPA 801, 1998, "Standard for Fire Protection for Facilities Handling Radioactive Materials," National Fire Protection Association.

PRD-112, 1998, "Criticality Safety Program Requirements Manual," Rev. 1, June 1, 1998.

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Appendix A

Technical and Functional Requirements
Document Change Log—From Revision 2 to Revision 3

Appendix A

Technical and Functional Requirements Document Change Log—From Revision 2 to Revision 3

The document change log for the OU 7-10 Glovebox Excavator Method Project Technical and Functional Requirements document, which records the changes from Revision 2 of the technical and functional requirements document to Revision 3, is contained in Table A-1.

Generally, Table A-1 identifies only those sections where significant (i.e., noneditorial) changes were made. However, Section 3 of Table A-1 contains a listing of all requirement statements (and associated bases) regardless of their change status. This is to provide the reader with a positive means for determining whether a given requirement has changed or not. "No change" is indicated in the justification for change column for requirements that have not been modified.

Table A-1. Technical and functional requirements document change log from Revision 2 to Revision 3.

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
Color key: Yellow = denotes a change Blue/underlined = additional material ~~Red/strikethrough~~ = deleted material				
FRONT MATTER				
Abstract. ~~Package waste zone material in containers acceptable at the Advanced Mixed Waste Treatment Facility (AMWTF).~~ Package and store waste zone material onsite, pending a decision on final disposition.	NA	Work scope change.	Abstract. Package and store waste zone material onsite, pending a decision on final disposition.	NA
Abstract. ~~Design, procurement, construction, reviews, testing, and acceptance for delivery will be based on the requirements listed in this document.~~ Design, procurement, construction, testing, operation, safe shutdown, layup, and deactivation, decontamination, and decommissioning will be based on the requirements listed in this document.	NA	Clarification change.	Abstract. Design, procurement, construction, testing, operation, safe shutdown, layup, and deactivation, decontamination, and decommissioning will be based on the requirements listed in this document.	NA
Acronyms (General)	NA	Acronym list was moved to front matter. Also, acronym list was updated to reflect acronyms used in Revision 3 of the T&FR.	Acronyms	NA
Definitions (General)	NA	Definitions section was moved to front matter.	Definitions (see specific changes below)	NA

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
Definitions. Deactivation, decontamination, and decommissioning (D&D&D). Generally refers to the set of activities or phase of the project dealing with the final disposition of the facility; for example, permanently disabling or deenergizing equipment, final decontamination (if necessary), and dismantlement for reuse or disposal.	NA	Added definition for this post-retrieval life-cycle phase since it is included in the project scope.	Definitions. Deactivation, decontamination, and decommissioning (D&D&D). Generally refers to the set of activities or phase of the project dealing with the final disposition of the facility; for example, permanently disabling or deenergizing equipment, final decontamination (if necessary), and dismantlement for reuse or disposal.	NA
Definitions. ~~1.~~4 Hazardous waste. ~~1.~~ Resource Conservation Recovery Act – Any hazardous waste as defined in 40 CFR 261.3, "Definition of Hazardous Waste." ~~(40 CFR 260.10). 2. This project specifically includes radioactive wastes and transuranic radioactive contaminated materials presently in Pit 9 in the general term "hazardous waste."~~	NA	Editorial changes and clarification.	Hazardous waste. Resource Conservation and Recovery Act - Any hazardous waste as defined in 40 CFR 261.3, "Definition of Hazardous Waste."	NA
Definitions. Layup. A period, rather than a process, during which the facility is monitored and maintained in stable and known conditions. Note: This term is comparable to the term surveillance and maintenance in the standard D&D&D vernacular.	NA	Added definition for this post-retrieval life-cycle phase since it is included in the project scope.	Definitions. Layup. A period, rather than a process, during which the facility is monitored and maintained in stable and known conditions. Note: This term is comparable to the term surveillance and maintenance in the standard D&D&D vernacular.	NA
Definitions. Shutdown (also safe shutdown). (1) The set of activities (i.e., process) performed to identify and mitigate facility hazards to place said facility in stable and known conditions that are cost-effective to maintain and (2) the state of the facility after shutdown activities were successfully performed. Note: This term is related to the term deactivation in the standard D&D&D vernacular, which implies permanent disabling of equipment. However, as used in this plan, shutdown relative to equipment and systems implies temporary versus permanent disabling or deenergizing (e.g., disconnecting equipment from its source of power by an easily reversible method). Deactivation as a part of D&D&D has a more permanent connotation.	NA	Added definition for this post-retrieval life-cycle phase since it is included in the project scope.	Definitions. Shutdown (also safe shutdown). (1) The set of activities (i.e., process) performed to identify and mitigate facility hazards to place said facility in stable and known conditions that are cost-effective to maintain and (2) the state of the facility after shutdown activities were successfully performed. Note: This term is related to the term deactivation in the standard D&D&D vernacular, which implies permanent disabling of equipment. However, as used in this plan, shutdown relative to equipment and systems implies temporary versus permanent disabling or deenergizing (e.g., disconnecting equipment from its source of power by an easily reversible method). Deactivation as a part of D&D&D has a more permanent connotation.	NA

Table A-1. (continued).

Technical and Functional Requirements Document - Revision _	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
Definitions. ~~1.4~~ Transuranic (TRU). Those elements with an atomic number greater than that of uranium (i.e., atomic number greater than 92). ~~Alpha emitting transuranium radionuclides (atomic number greater than 92), with half-lives greater than 20 years, and concentrations greater than or equal to 100 nCi/g at the time of assay. Note: This definition specifically excludes Pu-241 (a pure beta emitter) and Cm-244 (an alpha emitter with an 18.1 year half-life).~~	NA	12/2001 Response to Agency comment #86 on draft CDR.	Definitions. Transuranic (TRU). Those elements with an atomic number greater than that of uranium (i.e., atomic number greater than 92).	NA
Definitions. ~~1.4~~ Transuranic waste. Generally, ~~W~~without regard to source or form, waste that is contaminated with alpha-emitting ~~transuranium radionuclides,~~ transuranic isotopes with half-lives greater than 20 years~~,~~ and concentrations greater than or equal to 100 nCi/g of waste at the time of assay. At the Idaho National Engineering and Environmental Laboratory (INEEL), waste~~s~~ containing Ra~~radium~~-225 and U~~uranium~~-233 are included as transuranic ~~TRU~~ waste~~s (RRWAC)~~.	NA	Editorial and clarification changes.	Definitions. Transuranic waste. **Generally, without regard to source or form, waste that is contaminated with** alpha-emitting transuranic **isotopes with half-lives greater** than 20 years and concentrations greater than or equal to 100 nCi/g of waste at the time of assay. At the Idaho National Engineering and Environmental Laboratory (INEEL), waste containing Ra-225 and U-233 are included as transuranic waste.	NA
SECTION 1, INTRODUCTION				
1. Introduction. ~~Package waste zone material in containers acceptable at the Advanced Mixed Waste Treatment Facility (AMWTF).~~ Package and store waste zone material onsite, pending a decision on final disposition.	NA	Work scope change.	1. Introduction. Package and store waste zone material onsite, pending a decision on final disposition.	NA
1. Introduction. ~~Design, procurement, construction, reviews, testing, and acceptance for delivery shall be based on the requirements listed in this document.~~ Design, procurement, construction, testing, operation, safe shutdown, layup, and deactivation, decontamination, and decommissioning shall be based on the requirements listed in this document.	NA	Clarification change.	1. Introduction. Design, procurement, construction, testing, operation, safe shutdown, layup, and deactivation, decontamination, and decommissioning shall be based on the requirements listed in this document.	NA
1.1 Waste Area Group 7 has been subdivided into ~~14~~ 13 OUs.	NA	Operable Units 13 and 14 were combined into the comprehensive remedial investigation and feasibility study in 1995 (Huntley and Burns 1995).	1.1 Waste Area Group 7 has been subdivided into 13 OUs.	NA

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
1.1 The project facilities and processes will be designed to safely conduct a waste zone material retrieval demonstration in a selected area of OU 7-10. The project pr ation and retrieval; sampling, packaging, and storage; shutdown; deactivation, decontamination, and decommissioning (D&D&D); safeguards and security; and environmental monitoring. Project facilities include a Weather Enclosure Structure (WES), Retrieval Confinement Structure (RCS), Packaging Glovebox System (PGS), and ventilation system. ~~The OU 7-10 Glovebox Excavator Method project facilities and processes will be designed to safely conduct a waste zone material retrieval demonstration in a selected area of Pit 9. The Glovebox Excavator project facilities and processes consist of excavation and retrieval; sampling, packaging, and storage; the confinement facility; utilities; safeguards and security considerations; and environmental monitoring.~~	NA	Clarification changes were made to the text and "shutdown; deactivation, decontamination, and decommissioning (D&D&D);" was added since these phases are included in the project scope.	1.1 The project facilities and processes will be designed to safely conduct a waste zone material retrieval demonstration in a selected area of OU 7-10. The project processes consist of excavation and retrieval; sampling, packaging, and storage; shutdown; deactivation, decontamination, and decommissioning (D&D&D); safeguards and security; and environmental monitoring. Project facilities include a Weather Enclosure Structure (WES), Retrieval Confinement Structure (RCS), Packaging Glovebox System (PGS), and ventilation system.	NA
1.2 This T&FR document defines the requirements for ~~the Glovebox Excavator Method project to the extent that the requirements are known at the beginning of conceptual design~~ this project. It is not intended to define analysis or evaluation tasks that may be ~~necessary~~ performed as part of the design activity. ~~Should these analysis efforts identify additional requirements necessary to guide or constrain the design, they will be added to this T&FR via the project change control process.~~ Requirements that are not yet completely defined will contain "TBD" (to be determined) within the requirement statement. Resolution of these TBDs will be made ~~via~~ through identified actions that will be tracked to closure in the project action tracking system.	NA	The project is past conceptual design. Updated statement to reflect this. TBDs still exist relative to post-design activities.	1.2 This T&FR document defines the requirements for this project. It is not intended to define analysis or evaluation tasks that may be performed as part of the design activity. Requirements that are not yet completely defined will contain "TBD" (to be determined) within the requirement statement. Resolution of these TBDs will be made through identified actions that will be tracked to closure in the project action tracking system.	NA
1.3 This T&FR document is the product of the combined activities of the ~~OU 7-10 Glovebox Excavator Method~~ project team. The ~~OU 7-10~~	NA	Text clarification and correction to reflect that processing of T&FR updates will be per	1.3 This T&FR document is the product of the combined activities of the project team. The project engineer has ultimate responsibility for the	NA

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
~~Glovebox Excavator Method Project Engineer~~ project engineer has ~~the~~ ultimate responsibility for the content and approval of this document. Updates to the T&FR document will be processed in accordance with ~~the OU 7-10 Glovebox Excavator Method project~~ INEEL procedures.		INEEL document control procedures.	content and approval of this document. Updates to the T&FR document will be processed in accordance with INEEL procedures.	
~~1.4 Definitions/Glossary~~	NA	Definitions section was moved to front matter. Refer to front matter section of change log for changes to definitions.		
1.4 Requirement Verification. Verification of the requirements contained in this document will be performed to ensure that each requirement has been met. Initial requirement verification will be accomplished by review or analysis using the design output documents (i.e., drawings, specifications, and engineering design files) available at Critical Decision 2/3. This verification will provide assurance that the finished design is valid and complete and will be documented in a standalone matrix. Requirement verification methods, therefore, are no longer tracked within the body of this T&FR document. In addition, follow-on requirement verification is planned to occur as documented in "Integrated Acceptance Test/Turnover Plan for the OU 7-10 Glovebox Excavator Method Project (Draft)." Although PLN-1113 draws from the standard set of verification methods (i.e., analysis, demonstration, inspection, review, and test), as applicable and appropriate, for the verification of T&FRs, its primary purpose is to identify requirements to be verified through testing. Verification of testable requirements will be performed using a variety of test types including but not limited to vendor, construction checkout, mockup, system operation, and integrated testing. These tests, as well as the other verification methods, provide assurance that the project structures, systems, and components (SSCs) will	NA	Update T&FR document to reflect current plan for requirement verification.	1.4 Requirement Verification. Verification of the requirements contained in this document will be performed to ensure that each requirement has been met. Initial requirement verification will be accomplished by review or analysis using the design output documents (i.e., drawings, specifications, and engineering design files) available at Critical Decision 2/3. This verification will provide assurance that the finished design is valid and complete and will be documented in a standalone matrix. Requirement verification methods, therefore, are no longer tracked within the body of this T&FR document. In addition, follow-on requirement verification is planned to occur as documented in "Integrated Acceptance Test/Turnover Plan for the OU 7-10 Glovebox Excavator Method Project (Draft)." Although PLN-1113 draws from the standard set of verification methods (i.e., analysis, demonstration, inspection, review, and test), as applicable and appropriate, for the verification of T&FRs, its primary purpose is to identify requirements to be verified through testing. Verification of testable requirements will be performed using a variety of test types including but not limited to vendor, construction checkout, mockup, system operation, and integrated testing. These tests, as well as the other verification methods, provide assurance that the project structures, systems, and components (SSCs) will	NA

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
function as required and meet expected performance levels.			function as required and meet expected performance levels.	
~~1.5 Acronyms~~	NA	Acronym list was moved to front matter. Refer to front matter section of change log for changes to acronyms.		
1.5 Change Log Changes from Revision 2 to Revision 3 of this T&FR document are contained in Appendix A, "Technical and Functional Requirements Document Change Log—From Revision 2 to Revision 3."	NA	Change log was added to the T&FR as Appendix A.	1.5 Change Log Changes from Revision 2 to Revision 3 of this T&FR document are contained in Appendix A, "Technical and Functional Requirements Document Change Log—From Revision 2 to Revision 3."	NA
SECTION 2, OVERVIEW				
2.1 The storage system includes ~~a storage area~~ provisions for drum assay and storing packaged waste zone material~~s~~ both with and without polychlorinated biphenyl (PCB) contamination~~, and cargo containers for PCB-contaminated waste~~.	NA	Clarification.	2.1 The storage system includes provisions for drum assay and storing packaged waste zone material both with and without polychlorinated biphenyl (PCB) contamination.	NA
2.1 - 1c. An excavator ~~that will~~ to retrieve soil and waste zone material, and sample the underburden.	NA	To include underburden sampling in retrieval system functions.	2.1 - Retrieval system (third bullet) – An excavator to retrieve soil and waste zone material, and sample the underburden.	NA
2.1 - 2(new second bullet). A fissile material monitor at each glovebox to assist operators in controlling the amount of fissile material loaded into each drum.	NA	To include fissile monitoring of waste materials in material packaging system functions.	2.1 - Material packaging system (second bullet) – A fissile material monitor at each glovebox to assist operators in controlling the amount of fissile material loaded into each drum.	NA
2.2 Facility~~,~~ Structure, System, and Component ~~(SSC)~~ Classification. ~~Criteria in DOE-ID Order 420.D, "Requirements And Guidance For Safety Analysis" will be used to identify structures, systems, and components (SSCs) that are safety-significant.~~ Safety-significant SSCs are identified in accordance with DOE-ID Order 420.D, "Requirements and Guidance for Safety Analysis." ~~There are no~~ No safety-class SSCs were identified. Safety significant SSCs will meet ~~performance category 2 (PC-2)~~ Performance Category (PC) -2 criteria for natural phenomena hazards.	NA	The project is past conceptual design. Updated statement to reflect this.	2.2 Facility Structure, System, and Component Classification. Safety-significant SSCs are identified in accordance with DOE-ID Order 420.D, "Requirements and Guidance for Safety Analysis." No safety-class SSCs were identified. Safety significant SSCs will meet Performance Category (PC) -2 criteria for natural phenomena hazards.	NA

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
2.3, para 2 - The carts will transport waste zone material inside the gloveboxes~~,~~ where it will be inspected, ~~categorized,~~ sampled, and packaged.	NA	Clarification.	2.3, para 2 - The carts will transport the waste zone material inside the gloveboxes where it will be inspected, sampled, and packaged.	NA
2.3, para 3 - After waste zone material excavation is complete, samples of the underburden will be taken and the pit will be backfilled for ~~closure~~ shutdown ~~prior to~~ before the ~~deactivation, decontamination, and dismantlement (DD&D)~~ D&D&D phase.	NA	To use terminology consistent with the project's Facility Shutdown Plan and D&D&D Preplan.	2.3, para 3 - After waste zone material excavation is complete, samples of the underburden will be taken and the pit will be backfilled for shutdown before the D&D&D phase.	NA
SECTION 3, REQUIREMENTS AND [illegible]ES				
Section 3, general. Verification methods deleted.	NA	Verification methods were removed from T&FR body as a result of the more generalized approach to verification as discussed in Section 1.4 (as revised for Rev. 3).		
3.1.1.1-1. The project shall provide a weather enclosure for the work area around the confinement.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description.	No change.	3.1.1.1-1. The project shall provide a weather enclosure for the work area around the confinement.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description.
3.1.1.1-2. The project shall provide a confinement for radiological and hazardous materials.	DOE Order 420.1, "Facility Safety," and WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Retrieval System, The PGS and the building that covers the retrieval area (the RCS) form the ~~pit is a~~ confinement. The weather enclosure that covers the confinement is not considered a confinement.	To include a reference to DOE Order 420.1 and specify for clarity that the packaging glovebox is also part of the confinement.	3.1.1.1-2. The project shall provide a confinement for radiological and hazardous materials.	DOE Order 420.1, "Facility Safety," and WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Retrieval System. The PGS and the building that covers the retrieval area (the RCS) form the confinement. The weather enclosure that covers the confinement is not considered a confinement.
3.1.1.1-3. The project shall conduct one retrieval campaign.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 1.3, Background, Applications reduced from five to one. There will be no relocations of the system.	No Change.	3.1.1.1-3. The project shall conduct one retrieval campaign.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 1.3, Background, Applications reduced from five to one. There will be no relocations of the system.
3.1.1.1-4 The project waste zone material excavation volume shall be between 57 and 96 m^3 (75 and 125 ~~cubic yards~~ yd^3) of waste zone material.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach and 4.3.1, Modification Description.	For consistency with other parts of the document, added the metric system equivalent to the cubic yards of waste to be removed.	3.1.1.1-4 The project waste zone material excavation volume shall be between 57 and 96 m^3 (75 and 125 yd^3) of waste zone material.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Sections 2.1, Recommended Approach, and 4.3.1, Modification Description.
3.1.1.1-5. The project shall ~~provide~~ include a ventilation system ~~as part of the confinement system~~ to provide defense-in-depth for confinement of airborne radiological and hazardous	DOE Handbook, DOE-HDBK 1132-99, "Implementation Guide for Use in Developing Documented Safety Analysis to Meet Subpart B of 10 CFR 830," a handbook associated with DOE	To clarify the purpose and source for the ventilation system. DOE Order 420.1 requires a physical confinement system,	3.1.1.1-5. The project shall include a ventilation system to provide defense-in-depth for confinement of airborne radiological and hazardous materials.	DOE Handbook, DOE-HDBK 1132-99, "Implementation Guide for Use in Developing Documented Safety Analysis to Meet Subpart B of 10 CFR 830," a handbook associated with DOE

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
materials.	Order 420.1, "Facility Safety," states: "The design of a confinement ventilation system ensures the desired airflow at all times and specifically when personnel access doors or hatches are open. When necessary, air locks or enclosed vestibules may be used to minimize the impact of open doors or hatches on the ventilation system and to prevent the spread of airborne contamination within the facility."	and not specifically a ventilation system.		Order 420.1, "Facility Safety," states: "The design of a confinement ventilation system ensures the desired airflow at all times and specifically when personnel access doors or hatches are open. When necessary, air locks or enclosed vestibules may be used to minimize the impact of open doors or hatches on the ventilation system and to prevent the spread of airborne contamination within the facility."
3.1.1.2-1. The project shall characterize, package, and store waste zone material ~~and overburden soil~~ that has been retrieved.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements.	Change necessary to reflect that the project may not perform any additional characterization of removed overburden soil (i.e., beyond existing data) and may not store removed overburden soil (i.e., if immediate disposal is selected).	3.1.1.2-1. The project shall characterize, package, and store waste zone material that has been retrieved.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements.
3.1.1.2-2. The project shall package samples obtained during retrieval and packaging activities for subsequent analysis.	Sampling is required to support ~~waste determination~~ characterization of waste zone material ~~and soils in containers that are going into interim storage~~.	Clarification of basis statement. 1.Sampling supports more than waste determination. 2."and soils" deleted to avoid confusion with overburden/ underburden soils. Interstitial soil (the intended meaning) is already covered by "waste zone material." 3."interim storage" removed since it implies that storage before "permitted" storage must occur.	3.1.1.2-2. The project shall package samples obtained during retrieval and packaging activities for subsequent analysis.	Sampling is required to support characterization of waste zone material.
3.1.1.2-3. The project shall provide ventilation as defense-in-depth to ~~contain~~ confine airborne radiological and hazardous materials during waste zone material characterization and packaging.	~~DOE Order 420.1, Facility Safety.~~ DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees" states: "For hazards identified either in the facility design or during the development of procedures, controls shall be incorporated in the appropriate facility design or procedure." The inclusion of a ventilation system in the design provides for engineering control of airborne radiological and hazardous materials during waste zone material characterization and packaging.	To clarify the source for the confinement ventilation system. DOE Order 420.1 requires a physical confinement system, and not specifically a ventilation system.	3.1.1.2-3. The project shall provide ventilation as defense-in-depth to confine airborne radiological and hazardous materials during waste zone material characterization and packaging.	DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees" states: "For hazards identified either in the facility design or during the development of procedures, controls shall be incorporated in the appropriate facility design or procedure." The inclusion of a ventilation system in the design provides for engineering control of airborne radiological and hazardous materials during waste zone material characterization and packaging.

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
3.1.1.3-1. The project shall characterize retrieved waste zone material for safe storage.	Stage II objective. WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements. ~~EDF-3032, OU 7-10 Glovebox Excavator Method Project Storage Requirements and Approach.~~ There are a number of applicable or relevant and appropriate requirements (ARAR) requirements that apply to storage that must be met (i.e., Resource Conservation and Recovery Act [RCRA]; Toxic Substances Control Act [TSCA]; and DOE Order 435.1, "Radioactive Waste Management").	Requirement changed to clarify which materials must be characterized; to avoid confusion with removed overburden, which may not require additional characterization; and for consistency of terminology use. Basis statement modified to identify a more appropriate set of source documents.	3.1.1.3-1. The project shall characterize retrieved waste zone material for safe storage.	Stage II objective. WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements. There are a number of applicable or relevant and appropriate requirements (ARAR) requirements that apply to storage that must be met (i.e., Resource Conservation and Recovery Act [RCRA]; Toxic Substances Control Act [TSCA]; and DOE Order 435.1, "Radioactive Waste Management").
3.1.1.3-2. The project shall be capable of compliant storage of Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and radioactive wastes in accordance with substantive requirements of applicable or relevant and appropriate requirements (ARARs).	There are a number of ARAR requirements that apply to storage that must be met (i.e., Resource Conservation and Recovery Act [RCRA]; Toxic Substances Control Act [TSCA]; and DOE Order 435.1, "Radioactive Waste Management"). The requirements affect the required facility (containment requirements), waste handling (separation of incompatibles), packaging, and emergency equipment~~, etc.~~ as clarified in EDF-3032, *OU 7-10 Glovebox Excavator Method Project Storage Requirements and Approach.*	Editorial and clarification changes.	3.1.1.3-2. The project shall be capable of compliant storage of Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and radioactive waste in accordance with substantive requirements of applicable or relevant and appropriate requirements (ARARs).	There are a number of ARAR requirements that apply to storage that must be met (i.e., Resource Conservation and Recovery Act [RCRA]; Toxic Substances Control Act [TSCA]; and DOE Order 435.1, "Radioactive Waste Management"). The requirements affect the required facility (containment requirements), waste handling (separation of incompatibles), packaging, and emergency equipment, as clarified in EDF-3032, *OU 7-10 Glovebox Excavator Method Project Storage Requirements and Approach.*
3.1.2.1-1. The project shall remove overburden from the selected retrieval area before beginning waste zone material retrieval.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Process Description. The angular area ~~shown~~ will be braced with a vertical-side shoring box. The excavation system will remove ~~the~~ overburden as practical contained within this shoring box.	Editorial changes and to clarify that all overburden within the shoring box may not be practical to remove.	3.1.2.1-1. The project shall remove overburden from the selected retrieval area before beginning waste zone material retrieval.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Process Description. The angular area will be braced with a vertical-side shoring box. The excavation system will remove overburden as practical contained within this shoring box.
3.1.2.1-2. The project shall remove the overburden in a manner that is protective of the environment, community, and workers.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3, Process Description. Overburden will be removed to a specified depth.	No change.	3.1.2.1-2. The project shall remove the overburden in a manner that is protective of the environment, community, and workers.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3, Process Description. Overburden will be removed to a specified depth.
3.1.2.1-3. The project shall remove waste zone material from the selected plot in OU 7-10 ~~Pit 9 subject to the constraint of angle of repose achieved in the pit excavation.~~	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.4, Risk Estimate, Table 4.3-8. Waste zone material includes waste and interstitial soil. The Glovebox Excavator Method Project site will be selected to avoid the known large object exceptions. Volume and mass	The changes are to remove an unintended interpretation – that is, that the volume of waste zone material removed from the excavation area is driven by the angle of repose. The	3.1.2.1-3. The project shall remove waste zone material from the selected plot in OU 7-10.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.4, Risk Estimate, Table 4.3-8. Waste zone material includes waste and interstitial soil. The Glovebox Excavator Method Project site will be selected to avoid the known large object exceptions. Volume and mass

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
	limitations are based on equipment that will be used (routine use) for mass handling, and volume capacity as described in the WAG 7 Analysis of OU 7-10 Stage II Modifications Report. The volume of waste zone material removed from the selected plot in OU 7-10, as well as the surface area of the underburden, will be limited by the naturally occurring angle of repose that can be achieved in the pit excavation.	project will remove the waste zone material necessary to meet the 75 yd^3 minimum requirement, considering the angle of repose, to accomplish the underburden sampling requirements. The angle of repose as a limiting factor has been changed to reflect a future conditional status and moved to the basis statement.		limitations are based on equipment that will be used (routine use) for mass handling, and volume capacity as described in the WAG 7 Analysis of OU 7-10 Stage II Modifications Report. The volume of waste zone material removed from the selected plot in OU 7-10, as well as the surface area of the underburden, will be limited by the naturally occurring angle of repose that can be achieved in the pit excavation.
3.1.2.1-4. The project shall be capable of retrieving wastes from deteriorated waste containers.	Waste from the OU 7-10 Glovebox Excavator Method excavation zone must be retrieved. ~~Some drums containing the waste may be deteriorated and therefore it will be necessary to retrieve the waste that was from those drums.~~	Editorial changes and simplification.	3.1.2.1-4. The project shall be capable of retrieving waste from deteriorated waste containers.	Waste from the OU 7-10 Glovebox Excavator Method excavation zone must be retrieved.
3.1.2.1-5. The project shall be capable of differentiating between overburden, waste zone material, and underburden.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach, 4.1.5 Risk Analysis, 4.2.1 Recommended Approach, 4.3.1 Process Description, and Figure 4.3-2. Generally, ~~O~~overburden will be removed to a ~~specific~~ depth of 1 to 1.1 m (3 to 3.5 ft) as described in the *Excavation Plan and Sequential Process Narrative for the OU 7-10 Glovebox Excavator Method Project* (INEEL/EXT-02-00703). The remaining overburden will be considered waste zone material. The level of the underburden will be considered reached when no more debris is encountered. ~~No underburden will be removed, except for core samples. Interstitial soil and waste will be removed together as waste zone material.~~	Clarification.	3.1.2.1-5. The project shall be capable of differentiating between overburden, waste zone material, and underburden.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach; 4.1.5, Risk Analysis; 4.2.1, Recommended Approach; 4.3.1, Process Description; and Figure 4.3-2. Generally, overburden will be removed to a depth of 1 to 1.1 m (3 to 3.5 ft) as described in the *Excavation Plan and Sequential Process Narrative for the OU 7-10 Glovebox Excavator Method Project* (INEEL/EXT-02-00703). The remaining overburden will be considered waste zone material. The level of the underburden will be considered reached when no more debris is encountered.
3.1.2.1-6. The project shall use methods and techniques to minimize the spread of contamination from waste zone material into the overburden and underburden material.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3, Process Description. ~~Prevention would be accomplished through the use of processes, procedures, and equipment.~~	Simplification. 03/2002 Response to Agency comment #6 on draft CDR.	3.1.2.1-6. The project shall use methods and techniques to minimize the spread of contamination from waste zone material into the overburden and underburden material.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3, Process Description.
3.1.2.1-7. The project shall be capable of controlling the dust generation within the confinement.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description. Dust lowers visibility and spreads	No change.	3.1.2.1-7. The project shall be capable of controlling the dust generation within the confinement.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 4.3.1, Modification Description. Dust lowers visibility and spreads

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
	airborne contamination; it therefore must be mitigated.			airborne contamination; it therefore must be mitigated.
3.1.2.1-8. The project shall correlate excavator scoops with pit zones and drum numbers with an accuracy of plus or minus 1 m (3 ft).	Agreement from April 30, 2002 meeting, "OU 7-10 Glovebox Excavator Method Project Integrated Planning of Excavation, Drumming, and Sampling." Request originating from November 8, 2001 Bechtel BWXT Idaho, LLC; DOE; U.S. Environmental Protection Agency (EPA); and Idaho Department of Environmental Quality weekly telephone call. The following information was provided in response to agency comments regarding XYZ traceability in December 2001: "The project does not have a commitment to specific XYZ traceability, as did the previous 90 percent Stage II design. It must be understood that the value of this information at lower elevations may be quite limited, due to material sloughing off the sidewalls into the bottom of the excavation, as influenced by the natural angle of repose of the material. Horizontal travel of the bucket during load movement will also spread waste from one location to another."	New requirement to address correlation of excavator scoops with pit zones and drum numbers.	3.1.2.1-8. The project shall correlate excavator scoops with pit zones and drum numbers with an accuracy of plus or minus 1 m (3 ft).	Agreement from April 30, 2002 meeting, "OU 7-10 Glovebox Excavator Method Project Integrated Planning of Excavation, Drumming, and Sampling." Request originating from November 8, 2001 Bechtel BWXT Idaho, LLC; DOE; U.S. Environmental Protection Agency (EPA); and Idaho Department of Environmental Quality weekly telephone call. The following information was provided in response to agency comments regarding XYZ traceability in December 2001: "The project does not have a commitment to specific XYZ traceability, as did the previous 90 percent Stage II design. It must be understood that the value of this information at lower elevations may be quite limited, due to material sloughing off the sidewalls into the bottom of the excavation, as influenced by the natural angle of repose of the material. Horizontal travel of the bucket during load movement will also spread waste from one location to another."
3.1.2.2-1. The project shall segregate overburden soil from waste zone material.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Figure 4.3-2 identifies excavating and packaging overburden before disturbing the waste. The intent is to prevent cross contamination of waste into the overburden.	For consistency of use of "waste zone material."	3.1.2.2-1. The project shall segregate overburden soil from waste zone material.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Figure 4.3-2 identifies excavating and packaging overburden before disturbing the waste. The intent is to prevent cross contamination of waste into the overburden.
3.1.2.2-2. The project shall be capable of conveying contained liquids, sludges, and solids between process areas.	The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach, identifies separate process areas for retrieval of waste versus sampling and packaging the waste. Process areas can include, but are not limited to, retrieval, material processing, packaging, and storage areas. It is permissible to transfer material in containerized batches. ~~It is permissible to transfer these materials in containerized batches. Process areas can include, but are not limited to, retrieval, material processing, packaging, and storage areas. The trace requirements require that waste~~	Clarification.	3.1.2.2-2. The project shall be capable of conveying contained liquids, sludges, and solids between process areas.	The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 2.1, Recommended Approach, identifies separate process areas for retrieval of waste versus sampling and packaging the waste. Process areas can include, but are not limited to, retrieval, material processing, packaging, and storage areas. It is permissible to transfer material in containerized batches.

Table A-1. (continued).

Technical and Functional Requirements Document - Revision 2	Basis - Revision 2	Justification for Change	Technical and Functional Requirements Document - Revision 3	Basis - Revision 3
	~~be retrieved, characterized, and stored. This requires transport between functional areas. The WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001, Section 3.3, Stage II Objectives and Requirements, does not include treatability studies. Materials present in storage would potentially be available for other uses post-Glovebox Excavator Method Project.~~			
3.1.2.2-3. The project shall provide limited capability to reduce the size of retrieved waste to allow placement in waste containers suitable for ~~interim~~ storage.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001. The material packaging system described on page 4-22 of the report includes a box for packaging items too large to fit into a 55-gal drum. The report ~~A~~also discusses on page 4-5 under "Drum or Box" Packaging - waste that cannot be reduced in size will be left in place. The current design uses an 85-gal drum for oversized waste instead of a box. ~~EDF-3032, OU 7-10 Glovebox Excavator Method Project Storage Requirements and Approach.~~	Deleted "interim" from the requirement statement to remove unintended implication that storage before permitted storage would necessarily occur. Clarification and simplification.	3.1.2.2-3. The project shall provide limited capability to reduce the size of retrieved waste to allow placement in waste containers suitable for storage.	WAG 7 Analysis of OU 7-10 Stage II Modifications, October 1, 2001. The material packaging system described on page 4-22 of the report includes a box for packaging items too large to fit into a 55-gal drum. The report also discusses on page 4-5 under "Drum or Box" Packaging - waste that cannot be reduced in size will be left in place. The current design uses an 85-gal drum for oversized waste instead of a box.
3.1.2.2-4. The project shall stabilize any retrieved visible uncontained free liquid before packaging.	The INEEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC) requires that waste contain as little residual liquid as is reasonably achievable including (1) internal containers that contain no more than 1 in. of liquid in the bottom and (2) total residual liquid in the final waste container does not exceed 1% by volume of that container (i.e., 1/2 gal per 55 gal drum). The criticality safety evaluation also requires that liquid be stabilized when encountered to reduce availability of moderator. ~~Free liquids are both short-term and long-term hazards in the storage of hazardous materials, and require solidification and stabilization. The Resource Conservation and Recovery Act (RCRA) definition of, and test for, free liquids would require testing in excess of what the Agencies agreed would be appropriate for short-term storage of the OU 7-10 Glovebox Excavator Method Project wastes, it was agreed that it would be adequate to stabilize only free liquids during visual inspection during~~	Clarification.	3.1.2.2-4. The project shall stabilize any retrieved visible uncontained free liquid before packaging.	The INEEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC) requires that waste contain as little residual liquid as is reasonably achievable including (1) internal containers that contain no more than 1 in. of liquid in the bottom and (2) total residual liquid in the final waste container does not exceed 1% by volume of that container (i.e., 1/2 gal per 55 gal drum). The criticality safety evaluation also requires that liquid be stabilized when encountered to reduce availability of moderator.